

Genetic and Psychosocial Influences

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Alcohol is available to any adult—and illegally to many minors—in the United States. While a sizeable minority of the population abuses alcohol, most persons abstain or drink safely. In families in which there is abusive drinking, children have an increased risk of abusing alcohol themselves, but most do not develop problems. Understanding why alcohol leads to trouble for many, but not most, people exposed to it is the goal of research on the etiology, or cause, of alcohol abuse and alcoholism.

It is already clear that some vulnerability to developing alcohol-related problems is conveyed genetically, and the idea that inheritance can take many forms has emerged from animal research. Studies in mice have demonstrated that various individual genes or groups of genes can shape very distinct responses to alcohol: for example, a preference for alcohol over water, sensitivity to its intoxicating effects, and the tendency to develop tolerance to it. By identifying the proteins these genes encode and the mechanisms by which the genes influence an animal's biochemical response to alcohol, scientists can gain insight into the features of human alcoholism and provide a basis for developing pharmaceuticals that short-circuit these genetically defined processes.

On a broader scale, one of the goals of research on genetics in humans is to determine to what extent individual differences in alcohol-related behavior are due to genetic versus environmental influence. A recent study in twins found that as much as two-thirds of the variability in drinking behavior in one population could be attributed to genetic factors in both men and women. Other twin studies are investigating the relative magnitude of various influences—genes, parental drinking, and peer influence—on alcohol consumption in youth. Identifying the genes that convey risk of alcoholism is a second major goal of genetic research; scans of the human genome reveal evidence of genes influencing alcoholism in certain chromosomal regions, including one stretch that has plausible candidate genes already known to be located there.

Understanding how inborn vulnerability plays out in the temperament and behavior of an individual in the milieu of parents, peers, and culture is the goal of psychosocial research on the cause of alcoholism. The traits and family characteristics found in children at risk because of a family history of alcoholism also predict risk in children of nonalcoholic parents. If alcoholism represents the end result of a sequence to which many factors contributed—inborn temperament and physiologic response to alcohol, effectiveness of parental nurturing, peer environment, and culture—then the hope is that by understanding the contributors and how they interact, it also will be possible to intervene before vulnerability becomes a destructive illness.